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Title:Terahertz emission from surface-immobilized gold nanospheres

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Abstract:Electromagnetic wave emission based on optical rectification at terahertz (THz) wavelengths was observed from surface-immobilized gold nanospheres (SIGNS) above a gold surface. Although the excitation wavelength is off-resonant with the localized surface plasmons, the THz emission field was observed to be approximately 4.8 times greater than that from a percolated gold thin film of 10 nm thickness. A theoretical calculation predicts that the light electric field is enhanced in the SIGN system, even at off-resonance wavelengths. The observed THz field amplitude was quadratic with the illumination light field, suggesting that the THz generation is due to a second-order nonlinear optical process.

Number of references:13

Inspec controlled terms:electric field effects - gold - nonlinear optics - plasmonics - surface plasmons - terahertz wave spectra

Uncontrolled terms:surface-immobilized gold nanospheres - terahertz emission - electromagnetic wave emission - optical rectification - terahertz wavelengths - gold surface - excitation wavelength - localized surface plasmons - light electric field - off-resonance wavelengths - THz field amplitude - illumination light field - THz generation - second-order nonlinear optical process - size 10 nm - Au

Inspec classification codes:A7865E Optical properties of metals and metallic alloys (thin films/low-dimensional structures) - A7870G Microwave and radiofrequency interactions with condensed matter - A7320M Collective excitations (surface states)

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